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EXAMINER	
LI, RUIXIANG	

ART UNIT	PAPER NUMBER
1646	

DATE MAILED: 08/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/689,832	TAUPIER ET AL.	
	Examiner	Art Unit	
	Ruixiang Li	1646	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of Application, Amendments, and/or Claims

1. Applicants' preliminary amendment filed on 02/17/2004 has been entered in full. Claims 1-12 are pending and under consideration.

Abstract

2. The abstract of the disclosure is objected to because of the presence of material that is unrelated to the invention. Correction is required. See MPEP § 608.01(b).

Rejections—35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claim 10 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter, a cell comprising a vector. The claim encompasses transgenic animals, including humans. It is suggested that the claim be amended to recite "an isolated cell" to overcome this rejection.

5. Claims 1-12 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well-established utility.

Claims 1-12 are drawn to an isolated nucleic acid comprising a nucleic acid sequence encoding the polypeptide of SEQ ID NO: 20, its variants or fragments, a vector comprising the nucleic acid, a cell comprising the vector, and a composition comprising the nucleic acid. The claimed invention is not supported by either a specific and substantial asserted utility or a well-established utility. A specific and substantial utility is one that is particular to the subject matter claimed and that identifies a "real world" context of use for the claimed invention which does not require further research.

The instant specification discloses a nucleic acid of SEQ ID NO: 19 that encodes the polypeptide of SEQ ID NO: 20. The specification asserts that the polypeptide of SEQ ID NO: 20 (or NOV10) encoded by the nucleic acid of SEQ ID NO: 19 is homologous to the chemokine receptor family of proteins that are important in neuronal signal transduction and lymphocyte chemoattraction (Table 1; the 2nd paragraph of page 8), and represents a new subfamily of the chemokine family of proteins (top of page 53). In particular, the specification asserts that the NOV10 polypeptide of the present invention has 29% sequence homology with a human chemokine receptor type I (Table 32). Nonetheless, the instant disclosure fails to provide any sufficient information or evidence on the specific biological functions or physiological significance of the polypeptide and fails to disclose a patentable utility for the claimed invention.

First, the invention lacks a well-established utility. A well-established utility is a specific, substantial, and creditable utility that is well known, immediately apparent, or

implied by the specification's disclosure of the properties of a material. The sequence and prior art search does not reveal that the polypeptide of SEQ ID NO: 20 or the nucleic acid encoding the polypeptide has any well-established biological functions or any physiological significance. No art of record discloses or suggests any property or activity for the claimed molecules such that another non-asserted utility would be well-established for the claimed invention.

Secondly, the present invention does not disclose a specific and substantial utility. The specification asserts that the NOV10 nucleic acids and polypeptides, antibodies and related compounds are useful in therapeutic and diagnostic application in disorders characterized by altered immune response to injury and infection (the 2nd paragraph of page 8 and top of page 53). These asserted utilities are not specific and substantial because they do not identify or reasonably confirm a "real world" context of use. First of all, In view of the diversity of structure and functions of the proteins, prediction of function using comparative sequence analysis may lead to the creation and propagation of assignment errors if not performed appropriately (see, Peer Bork and Eugene V. Koonin, Predicting functions from protein sequences--where are the bottlenecks? *Nature Genetics* 18:313-318,1998), especially when the degree of homology is low. Furthermore, the specification fails to disclose the biological functions of the claimed molecules and fails to provide evidence that establishes a diagnostic or therapeutic link between a specific disorder and the nucleic acid of the present invention. Clearly, further research would be required to identify a disease that is associated with the claimed molecules or a

disease that can be treated with the claimed molecules. See *Brenner v. Manson*, 383 U.S. 519, 148 USPQ 689 (Sup. Ct. 1966), noting that "a patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion."

Accordingly, the claimed invention is not supported by a specific and substantial asserted utility or a well-established utility.

6. Claims 1-12 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Furthermore, even if the nucleic acid encoding the polypeptide of SEQ ID NO: 20 were to have a patentable utility, the instant disclosure would not be found to be enabling for the full scope of the claimed invention.

The factors that are considered when determining whether a disclosure satisfies enablement requirement include: (i) the quantity of experimentation necessary; (ii) the amount of direction or guidance presented; (iii) the existence of working examples; (iv) the nature of the invention; (v) the state of the prior art; (vi) the relative skill of those in the art; (vii) the predictability or unpredictability of the art; and (viii) the breadth of the claims. *Ex Parte Forman*, 230 USPQ 546 (Bd Pat. App. & Int. 1986); *In re Wands*, 858 F. 2d 731, 8 USPQ 2d 1400 (Fed. Cir. 1988).

The breadth of the claims. Claims 1-7 are drawn to a genus of nucleic acids that are variants or fragments of the nucleic acid encoding the amino acid sequence

of SEEQ ID NO: 20. Claims 8-12 are drawn to a vector or a host cell comprising the nucleic acids or a composition comprising the nucleic acids. Since there is no functional limitation or any particular conserved structure recited in the claims, the genus encompasses an unreasonable number of inoperative nucleic acid molecules, which one skilled in the art would not know how to make and/or use.

Nature of the invention and the state of the prior art. The present invention is related to the nucleic acid that encodes the polypeptide of SEQ ID NO: 20, which does not have any defined biological functions or activities. The specification discloses that the NOV10 polypeptide of the present invention has 29% sequence homology with a human chemokine receptor type I (Table 32). The specification asserts that the polypeptide of SEQ ID NO: 20 (or NOV10) encoded by the nucleic acid of SEQ ID NO: 19 is homologous to the chemokine receptor family of proteins that are important in neuronal signal transduction and lymphocyte chemoattraction (Table 1; the 2nd paragraph of page 8), and represents a new subfamily of the chemokine family of proteins (top of page 53). The prior art teaches a nucleotide sequence comprising nucleotides 930 to 1050 of SEQ ID NO: 19 of the present invention and encoding amino acids 311 to 350 of SEQ ID NO: 20 of the present invention (Mahairas et al., EMBL, Accession No. AQ225693, September 26, 1998). However, there are no sufficient teachings in the art on how to make and use the genus of the claimed nucleic acids.

The amount of direction or guidance presented and the existence of working examples. Other than the nucleic acid that encodes the polypeptide set

forth in SEQ ID NO: 20 (or its mature form), the instant disclosure fails to provide sufficient direction or working example on how to make and use nucleic acids that encode polypeptides that are less than 100% identical to the polypeptide of SEQ ID NO: 20 or the mature form thereof. There are no examples of functional variants and homologues of SEQ ID NO: 20 and the nucleic acids encoding the same. The instant disclosure does not show (i) which portions of the polypeptide of SEQ ID NO: 2 0 are critical to its activity; and (ii) what modifications (e.g., substitutions, deletions or additions) one can make to SEQ ID NO: 19 will result in a mutant or a fragment with the same functions as that of the polypeptide set forth in SEQ ID NO: 20.

The relative skill of those in the art, the predictability or unpredictability of the art, and the quantity of experimentation necessary. The skill in this area of work is not high because no art teaches how to make and use the instantly claimed nucleic acid encoding the polypeptide of SEQ ID NO: 20. It is unpredictable whether a variant or a fragment of SEQ ID NO: 20 would retain the same function as that of the full length of polypeptide of SEQ ID NO: 20. The state of the art (See, e.g., Ngo, et al, *The Protein Folding Problem and Tertiary Structure Prediction*, 1994, Merz, et al. (ed.), Birkhauser, Boston, MA, pp. 433 and 492-495) is such that the relationship between sequence of a protein and its activity is not well understood and is not predictable. Excising out portions of a protein or modifications to a protein, e.g., by substitutions or deletions, would often result in deleterious effects to the overall activity and effectiveness of the protein. Moreover, the disclosure fails to provide sufficient information on how to produce naturally occurring allelic variants from the

nucleic acid molecules. There is no sufficient guidance or working example on how to make and use the alleles. The prior art does not provide compensatory structural or correlative teachings to enable one skilled in the art to make and use the alleles.

Accordingly, even if the nucleic acid encoding the polypeptide of SEQ ID NO: 20 were to have a patentable utility, the specification does not reasonably provide enablement for the genus of nucleic acids encompassed by the instant claims. Thus, it would require undue experimentation for one skilled in the art to make and use the claimed invention commensurate in scope with the claims.

Claim Rejections—35 USC §112, 1st paragraph

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

To provide adequate written description and evidence of possession of a claimed genus, the specification must provide sufficient distinguishing identifying characteristics of the genus. The factors to be considered include disclosure of complete or partial structure, physical and/or chemical properties, functional characteristics, structure/function correlation, methods of making the claimed product, or any combination thereof.

Claims 1-7 are drawn to a genus of nucleic acids that are variants or fragments of the nucleic acid encoding the amino acid sequence of SEEQ ID NO: 20. Claims 8-12 are drawn to a vector or a host cell comprising the nucleic acids or a composition comprising the nucleic acids. The claims do not require that the nucleic acid or the polypeptide encoded by the nucleic acid possess any particular biological activity, nor any particular conserved structure, nor other disclosed distinguishing feature. Thus, the claims are drawn to a genus of nucleic acids that is defined only by a partial structure in the form of a recitation of percent identity or hybridization.

The instant disclosure of nucleic acid molecule of SEQ ID NO: 19 that encodes the polypeptide of SEQ ID NO: 20 does not adequately support the scope of the claimed genus, which encompasses a substantial variety of subgenera including full-length genes. A description of a genus of cDNA may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus, or of a recitation of structural features common to the genus, which features constitute a substantial portion of the genus. *Regents of the University of California v. Eli Lilly & Co.*, 119 F3d 1559, 1569, 43 USPQ2d 1398, 1406 (Fed. Cir. 1997). The instant disclosure fails to provide sufficient description information, such as definitive structural or functional features of the claimed genus of nucleic acids. There is no description of the conserved regions that are critical to the structure and function of the genus claimed. There is no description of the sites at which variability may be tolerated and there is no information regarding the relation of structure to function. The prior art does not provide compensatory structural or

correlative teachings to enable one skilled in the art to identify the encompassed nucleic acid molecules as being identical to those instantly claimed.

Moreover, the specification merely discloses a nucleic acid of SEQ ID NO: 19 and there is no such a nucleic acid variant sequence information or single nucleotide polymorphism encoding variant polypeptide disclosed. There is no description of the mutational sites that exist in nature, and there is no description of how the structure of the polypeptide encoded by SEQ ID NO: 19 relates to the structure of different variants. The general knowledge in the art concerning variants does not provide any indication of how the structure of one variant is representative of other unknown variants having concordant or discordant functions. The nature of variants is such that they are variant structures where the structure and function of one does not provide guidance to the structure and function of others.

Furthermore, claim 2 recites "a naturally occurring allelic nucleic acid variant", whereas claim 3 recites (a naturally occurring polypeptide variant". However, the instant disclosure has not provided sufficient description for one to distinguish a native sequence polypeptide from a polypeptide, for example, produced by a recombinant method or a synthetic method.

Due to the breadth of the claimed genus and lack of the definitive structural or functional features of the claimed genus, one skilled in the art would not recognize from the disclosure that the applicant was in possession of the claimed genus. Accordingly, only the isolated nucleic acid encoding the polypeptide of SEQ ID NO:

20 or its mature form, but not the full breadth of the claims meets the written description provision of 35 U.S.C. §112, first paragraph.

Claim Rejections—35 USC§ 112, 2nd paragraph

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 2, 3, and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2 and 3 are indefinite because claim 2 recites "a naturally occurring allelic nucleic acid variant", whereas claim 3 recites (a naturally occurring polypeptide variant". It is unclear form the instant disclosure how a naturally occurring variant differs from a variant, for example, produced by a recombinant method. Since it is unclear what are the metes and bounds of the term, the claims are indefinite.

Claim 6 is indefinite because they recite "...hybridizes under stringent conditions" without defining the hybridization conditions in the claim. Since neither the art nor the specification provides an unambiguous definition for the terms, the claims are indefinite.

Claim Rejections—35 USC § 102(b)

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1 and 5-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Mahairas et al. (EMBL, Accession No. AQ225693, September 26, 1998).

Mahairas et al. teach a nucleotide sequence comprising nucleotides 930 to 1050 of SEQ ID NO: 19 of the present invention and encoding amino acids 311 to 350 of SEQ ID NO: 20 of the present invention (see attached sequence alignment). By its nature, the nucleic acid complementary to the polynucleotide taught by Mahairas et al. hybridizes under stringent conditions to the nucleotide sequence of SEQ ID NO: 19. Mahairas et al. also teach vector, pBe1oBAC11, and a host cell, *E coli*, DH10B. Since Mahairas et al. teach the cloning the nucleic acid sequence, Mahairas et al. also teach the nucleic acid molecule in the presence of a carrier in a container. Thus, the reference of Mahairas et al. meets the limitations of claims 1 and 5-12.

Claim Objection—Minor Informality

13. Claim 10 is objected to because it depends upon itself. Appropriate correction is required.

Conclusion

14. No claims are allowed.

Advisory Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ruixiang Li whose telephone number is (571) 272-0875. The examiner can normally be reached on Monday through Friday from 8:30 am to 5:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Caputa, can be reached on (571) 272-0829. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, please contact the Electronic Business Center (EBC) at the toll-free phone number 866-217-9197.

Ruixiang Li

Ruixiang Li, Ph.D.
Examiner
July 30, 2005